

1 LENS ARRANGEMENT WITH FLUID CELL AND
2 PRESCRIPTIVE ELEMENT
3
4

5 CLAIMS
6

7 1. A lens arrangement for use in applying a corrective power,
8 comprising:

9 a) a fluid lens cell having a chamber formed by first and
10 second lens elements, the chamber being sealed by a seal and
11 containing a transparent fluid, the first and second lens elements being
12 made of a transparent material, one of the first or second lens
13 elements being flexible;

14 b) a passage coupled to the fluid lens cell so as to allow
15 communication with the chamber, the passage providing for flow of
16 the fluid therethrough so that the volume of the chamber can be
17 changed;

18 c) a rigid third lens element having first and second surfaces
19 that are shaped to provide optical correction, the third lens element
20 being removably coupled to an exterior of the fluid cell so as to be
21 adjacent to the fluid cell and optically aligned with the fluid cell.
22

23 2. The lens arrangement of claim 1 wherein the fluid cell is capable of
24 providing a null correction.
25

- 1 3. The lens arrangement of claim 2 wherein the fluid cell provides a null
2 correction when the flexible first or second lens element is unflexed.
3
- 4 4. The lens arrangement of claim 3 wherein at least one of the first or
5 second lens elements comprises a negative lens.
6
- 7 5. The lens arrangement of claim 1 wherein the flexible one of the first
8 or second lens elements comprises a membrane, the membrane having
9 an edge portion and a center portion, the edge portion being pivotally
10 coupled to an annular member between the first and second lens
11 elements, wherein the center portion of the membrane can flex.
12
- 13 6. The lens arrangement of claim 1 wherein the flexible one of the first
14 or second lens elements comprises a membrane and the third lens
15 element is adjacent to the membrane, there being a space between the
16 third lens element and the membrane to allow the membrane to flex.
17
- 18 7. The lens arrangement of claim 1 wherein one of the first or second
19 surfaces of the third lens element is spherical and the other of the first
20 or second surfaces is cylindrical.
21
- 22 8. The lens arrangement of claim 1 wherein one of the first or second
23 surfaces of the third lens element is cylindrical, and has a cylindrical
24 axis, the third lens element being rotatable relative to the fluid cell so
25 as to vary relative to the cylindrical axis orientation.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

9. The lens arrangement of claim 1 wherein the first and second lens elements each have two surfaces, with at least one of the surfaces of the first, second or third lens elements being coated, shaded or polarized.
10. The lens arrangement of claim 1 wherein the flexible one of the first or second lens elements comprises a membrane, the membrane having two flat surfaces.
11. The lens arrangement of claim 1 wherein the flexible one of the first or second lens elements comprises a membrane, the membrane having two surfaces, with one of the membrane surfaces being curved.
12. The lens arrangement of claim 1 wherein the third lens element is coupled to the fluid cell independently of the fluid lens seal, wherein the third lens element can be removed from the lens arrangement without disturbing the seal.
13. The lens arrangement of claim 12 wherein the third lens element is rotatably coupled to the fluid lens cell.
14. The lens arrangement of claim 1 wherein:
 - a) the third lens element comprises a prescription lens;

10001857-111901

1 b) the third lens element is coupled to the fluid cell by way of
2 an adapter which is structured and arranged for receiving the third
3 lens element.

4
5 15. The lens arrangement of claim 14 further comprising a frame, wherein
6 the adapter and the fluid cell form a smooth surface for bearing on the
7 nose of a human.

8
9 16. A lens arrangement for use in applying a corrective power,
10 comprising:

11 a) a base having first and second surfaces;

12 b) a flexible membrane having third and fourth surfaces, the
13 second surface of the base and the third surface of the membrane
14 being adjacent to each other and forming a chamber therebetween, the
15 membrane having an edge portion and a center portion, the edge
16 portion being coupled to the base wherein the center portion can flex;

17 c) the chamber being sealed and containing a transparent
18 fluid;

19 d) the base and the membrane being made of transparent
20 materials and forming a fluid cell;

21 e) a passage providing communication between the
22 chamber and the exterior of the fluid cell so as to allow the amount of
23 fluid within the chamber to be changed;

24 f) a corrective lens element having fifth and sixth surfaces
25 that are shaped to provide optical correction, the corrective lens

1 element being removably coupled to the base so as to be adjacent to
2 the fluid cell.

3

4 17. The lens arrangement of claim 16 wherein the corrective lens element
5 is rotatably coupled to the base.

6

7 18. The lens arrangement of claim 16 wherein one of the fifth or sixth
8 surfaces of the corrective lens element is spherical and the other of the
9 fifth or sixth surfaces is cylindrical.

10

11 19. The lens arrangement of claim 16 wherein the corrective lens element
12 is coupled to the base by way of a ring member.

13

14 20. The lens arrangement of claim 19 wherein the membrane edge portion
15 being pivotally coupled between the base and the ring member.

16

17 21. The lens arrangement of claim 16 wherein the corrective lens element
18 is adjacent to the membrane.

19

20 22. The lens arrangement of claim 16 wherein one of the third or fourth
21 surfaces of the membrane is spherical.

22

23 23. The lens arrangement of claim 16 wherein the first and second
24 surfaces of the base, the fluid and the third and fourth surfaces of the

1 membrane form a null correction when the membrane is in an
2 unflexed position.

3
4 24. The lens arrangement of claim 23 wherein the base comprises a
5 negative lens.

6
7 25. The lens arrangement of claim 16 wherein the base is mounted into an
8 eyewear frame.

9
10 26. The lens arrangement of claim 16, wherein:

11 a) one of the fifth or sixth surfaces of the corrective lens
12 element is spherical;

13 b) the other of the fifth or sixth surfaces of the corrective
14 lens element is cylindrical, the corrective lens element being rotatably
15 coupled to the base;

16 c) one of the third and fourth surfaces of the membrane is
17 spherical;

18 d) the first and second surfaces of the base, the fluid and the
19 third and fourth surfaces of the membrane form a null correction when
20 the membrane is in an unflexed position;

21 e) the base is mounted into an eyewear frame.

22
23 27. An arrangement of lenses, comprising:

24 a) a first lens and a second lens;

1 b) each of the first and second lenses comprising a fluid lens
2 cell having a chamber formed by first and second lens elements, the
3 chamber being sealed by a seal and containing a transparent fluid, the
4 first and second lens elements being made of a transparent material,
5 one of the first or second lens elements being flexible;

6 c) each of the first and second lenses comprising a passage
7 coupled to the fluid lens cell so as to allow communication with the
8 chamber, the passage providing for flow of the fluid therethrough so
9 that the volume of the chamber can be changed;

10 d) the passage communicating with a fluid pump, the pump
11 being controlled by a controller;

12 e) one of the first lens controller or the second lens
13 controller selectively controlling one or both of the first lens pump
14 and the second lens pump.

15
16 28. The arrangement of lenses of claim 27 wherein each of the first and
17 second lenses comprise a rigid third lens element having first and
18 second surfaces that are shaped to provide optical correction, the third
19 lens elements being removably coupled to an exterior of the fluid cell
20 so as to be adjacent to the fluid cell and optically aligned with the
21 fluid cell.